IN THE CLAIMS:

Please cancel claims 1-28 and substitute therefore new Claims 29-56.

Claims 1-28 (Canceled)

29. (New) A particle detector, comprising:

a spherical/ellipsoid shell comprising spherical and ellipsoid mirrors that define a focal point within an interior of the shell;

a pair of opposing first tubes passing through the spherical/ellipsoid shell and directed at the focal point, each of said tubes acting as inlets for directing particle flow in opposing directions to the focal point, wherein said tubes are substantially non-fluorescent; and

a light source directed at the focal point for directing light at the particles to generate fluorescence from the particles at or near the focal point.

30. (New) The particle detector of claim 29, wherein the light source is an ultra-violet light emitting diode or an ultra-violet laser.

31. (New) The particle detector of claim 29, further comprising another pair of opposing tubes passing through the spherical/ellipsoid shell and directed at the focal point.

32. (New) The particle detector of claim 29, further comprising a photon counter located outside of the shell for receiving fluorescence photons from within the shell.

33. (New) The particle detector of claim 32, further comprising an optical filter located between the shell and the photon counter.

34. (New) The particle detector of claim 33, wherein said optical filter is capable of filtering scattered and reflected light from said light source.

35. (New) The particle detector of claim 29, wherein the spherical mirror has a plurality of radial notches disposed therein for directing flows from the interior of the spherical/ellipsoid shell.

36. (New) The particle detector of claim 29, wherein the light source is located within the spherical/ellipsoid shell or exteriorly of the spherical/ellipsoid shell.

37. (New) The particle detector of claim 29, further comprising a light dump located opposite the light source and exteriorly of the spherical/ellipsoid shell, wherein said dump acts to prevent light from the light source from being reflected back into the spherical/ellipsoid shell after exiting the spherical/ellipsoid shell.

38. (New) The particle detector of claim 29, wherein the interior of the spherical/ellipsoid shell is adapted for fluid flow coupling to an external pump.

39. (New) The particle detector of claim 29, wherein exits of the respective tubes are located substantially equidistant from the focal point.

40. (New) The particle detector of claim 29, wherein inside diameters of the respective tubes are substantially equal.

41. (New) The particle detector of claim 29, wherein each of the pair of first tubes passes substantially concentrically through a respective one of a pair of second tubes to form a flow passage between an exterior of each first tube and an interior of the respective second tube, the flow passage for directing flows from the interior of the spherical/ellipsoid shell.

42. (New) A particle detector, comprising:

a body;

first and second end caps disposed at opposite ends of the body;

an ellipsoid mirror disposed within the first end cap;

a spherical mirror disposed within the body so as to abut the ellipsoid mirror to form a spherical/ellipsoid cavity within the particle detector, the spherical and ellipsoid mirrors defining a focal point within the cavity;

a pair of opposing tubes passing through the first end cap into the cavity and directed at the focal point, each of said tubes acting as an inlet for directing particles to the focal point in opposing directions, and wherein said tubes are substantially non-fluorescent;

a light source directed at the focal point for directing ultra violet light at the particles;

a photon counter disposed in the body between the second end cap and the spherical/ellipsoid cavity; and

a filter disposed in the body between the photon counter and spherical/ellipsoid cavity.

43. (New) The particle detector of claim 42, wherein the light source is a light emitting diode or a laser.

44. (New) The particle detector of claim 42, further comprising another pair of opposing tubes passing through the first end cap into the cavity and directed at the focal point.

45. (New) The particle detector of claim 42, wherein the light source is located within the spherical/ellipsoid cavity or exteriorly of the first end cap.

46. (New) The particle detector of claim 42, further comprising a light dump connected to an exterior of the first end cap and located opposite the light source that acts to prevent light from the light source from being reflected back into the spherical/ellipsoid cavity after exiting the spherical/ellipsoid cavity.

47. (New) The particle detector of claim 42, wherein the filter has a coating that acts to substantially prevent fluorescence therefrom.

48. (New) A method for detecting particles, comprising:

directing a pair of opposing particle flows at a focal point within a spherical/ellipsoid cavity having an ellipsoid mirror and a spherical mirror;

directing ultra-violet light at the focal point to illuminate the particles at or near the focal point to generate fluorescence from the particles at or near the focal point; and

directing fluorescence generated at or near the focal point to a target point.

49. (New) The method of claim 48, wherein directing fluorescence generated at or near the focal point to the target point comprises reflecting any fluorescence received at the ellipsoid mirror off of the ellipsoid mirror and onto the target point.

50. (New) The method of claim 49, wherein directing fluorescence generated at the focal point to a target point further comprises reflecting any fluorescence received at the spherical mirror off of the spherical mirror, back to the focal point, and onto the ellipsoid mirror, and reflecting this fluorescence onto the target point.

51. (New) The method of claim 48, further comprising directing another pair of opposing particle flows at the focal point.

52. (New) The method of claim 48, wherein the ultra-violet light originates from within the spherical/ellipsoid cavity or exteriorly of the spherical/ellipsoid cavity.

53. (New) The method of claim 48, further comprising directing the particle flow from the spherical/ellipsoid cavity through a plurality of notches in the spherical mirror.

54. (New) The method of claim 48, further comprising filtering the fluorescence before the fluorescence arrives at the target point.

55. (New) The method of claim 54, further comprising directing the filtered fluorescence to a photon counter.

56. (New) The method of claim 48, wherein directing the pair of opposing particle flows at the focal point comprises substantially balancing the flows.